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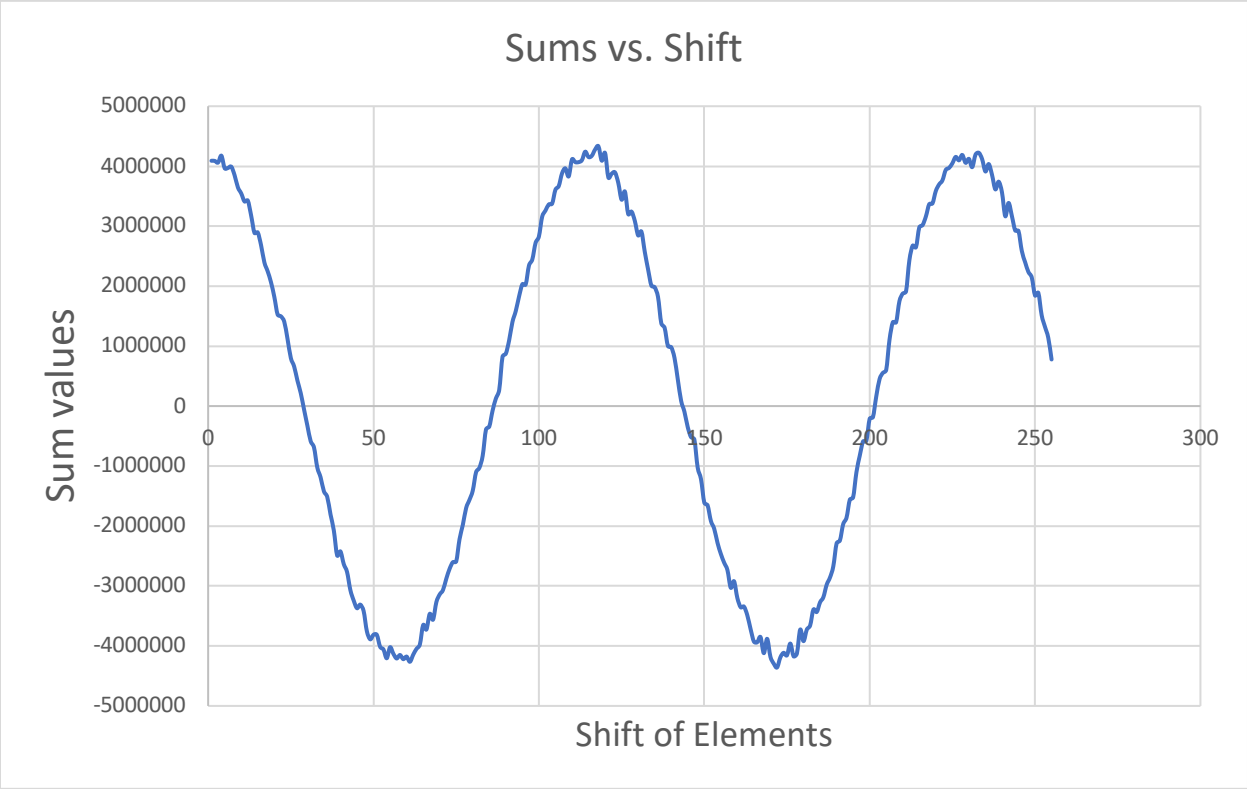
Project #7B

Autocorrelation using MPI

"Autocorrelation, also known as serial correlation, is the correlation of a signal with a delayed copy of itself as a function of delay. Informally, it is the similarity between observations as a function of the time lag between them."



The Secret Sine-Wave period is 100 shifts

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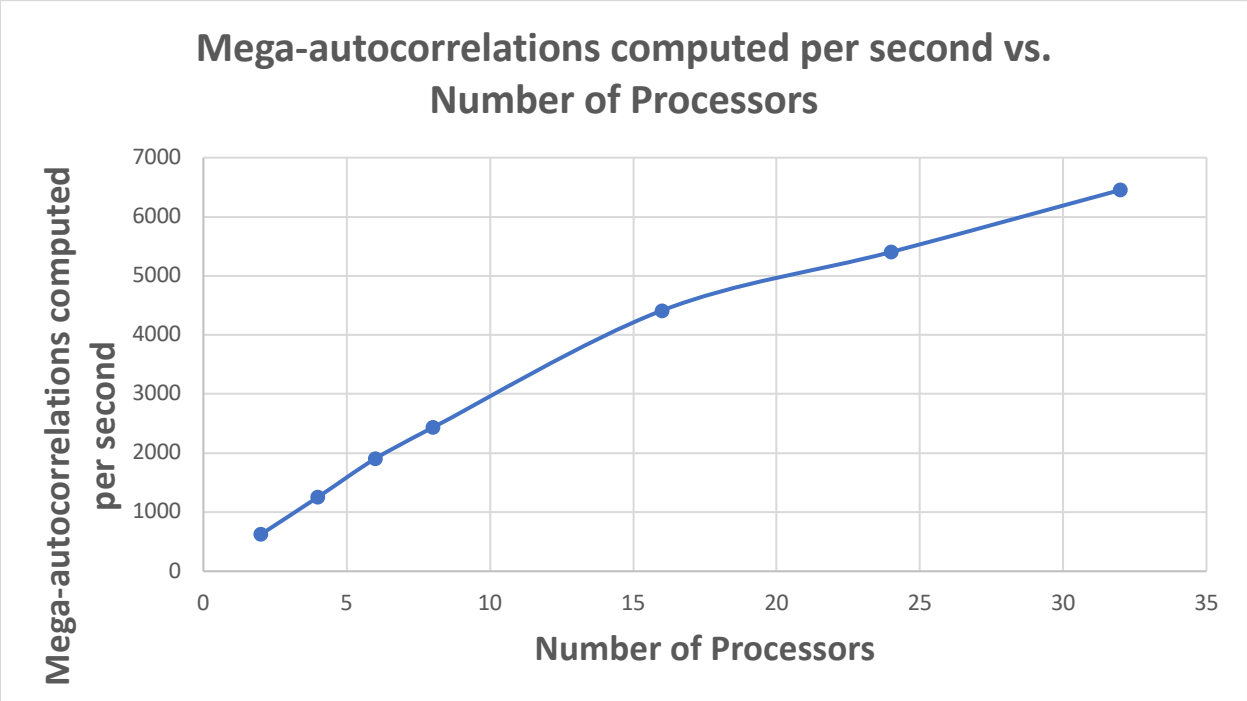

The patterns in the performance are an almost linear relation between number of processors and mega-autocorrelations computed per second. This linear relation is seen between 2 and 16 processors. After 16 processors the values of 24 and 32 start to see a a slight dip in performance.

The performances work this was because between 2 and 16 there is a rapid increase in performance due to data size and amount of work divided up between CPU's, however once you get above 16 CPU's the performance doesn't increase as much as each CPU is added. You are starting to see the diminishing returns due to the F parallel of this problem. After you keep adding cores every problem has a cap where the performance will plateau. Using 32 cores we do not reach this cap but you can see the graph trending towards a decrease in performance.